Goddard Procedures and Guidelines

DIRECTIVE NO.	GPG 8700.4E	**APPROVED BY Signature:**	*Original Signed by*
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Responsible Office: 300/Office of System Safety and Mission Assurance, Systems Management Office

Title: Integrated Independent Reviews

PREFACE

P.1 PURPOSE

This procedure establishes the process for planning and conducting Integrated Independent Reviews for Goddard Space Flight Center (GSFC) products.

P.2 APPLICABILITY

The Integrated Independent Review (IIR) process applies to the formulation and implementation of all GSFC products covered by the scope of the GSFC Quality Management System except as noted below. IIRs are used to evaluate the status of a project at the mission system-level and also at the spacecraft and instrument level. Engineering Peer Reviews, rather than IIRs, are used to evaluate the status of a project at the subsystem level and the results flow up to the IIRs. However, a deliverable spacecraft subsystem is subject to the IIR process. The IIR process does not apply to products not intended for space flight, to products at a level lower than a deliverable subsystem or instrument, sounding rockets and associated payloads, balloons and associated payloads, deliverable aircraft instruments or payloads, and to Shuttle Small Payloads (Hitchhiker, Space Experiment Module, Get-Away-Specials).

The Agency Program Management Council (PMC) has delegated governance of nearly all GSFC projects to the GSFC PMC. The IIR process applies directly to these projects. The IIR process is also applicable, with modifications as noted, to projects that report to the Agency PMC (i.e., have not been delegated to GSFC).

P.3 AUTHORITY

NPD 8730.3, NASA Quality Management System Policy (ISO 9000)

P.4 REFERENCES

a. NPD 8610.24, Expendable Launch Vehicle (ELV) Launch Services Pre-launch Readiness Reviews
b. NPG 7120.5, NASA Program and Project Management Processes and Requirements
c. GPG 1060.2, Management Review and Reporting for Programs and Projects
d. GPG 1410.2, Configuration Management
e. GPG 8700.6, Engineering Peer Reviews

P.5 CANCELLATION

GPG 8700.4D, Integrated Independent Reviews

P.6 SAFETY

Not applicable.

P.7 TRAINING

Not applicable.

P.8 RECORDS

Record Title	Record Custodian	Retention
IIRT Reports including RFAs; Project responses to RFAs; IIRT decisions on project responses.	Project Manager	*NRRS 8/5A1: Permanent Records may be retired to a Federal Records Center when 2 years old. Transfer to National Archives and Records Administration 15 years after completion of the project or when 25 years old, whichever is sooner
IIRT Reports to GSFC PMC for MCRR and MRR	Project Manager	*NRRS 8/5A1
Flight Readiness Report (Red Book)	Chief, Systems Review Office	*NRRS 8/5A1

**NRRS* – *NASA Records Retention Schedules*

P.9 METRICS

a. The Systems Management Office (SMO) will systematically solicit feedback from Program and Project Managers on the perceived value of the review process to the success of their projects. Composite data and recommendations for improvement will be analyzed annually.

b. The 13 systems management processes provide key metrics to trend over the life cycle of the project and benchmark against other projects. The IIRT co-chairs maintain individual project trends. Composite performance of all GSFC projects is analyzed annually.

P.10 DEFINITIONS

a. Integrated Independent Review Process - The streamlined GSFC review process that combines the objectives of traditional GSFC independent system reviews, Red Team Reviews, and independent reviews required by Headquarters (e.g., External Independent Readiness Review). The result is a single series of reviews conducted by a single review team.

b. Integrated Independent Review (IIR) - One of a series of system-level reviews conducted at critical project/product milestones in accordance with the IIR Plan. The purpose of an IIR is to add value and reduce risk through expert knowledge infusion. An IIR builds on the results of a robust set of engineering peer reviews, systematically evaluates technical and programmatic status, and provides independent assessment and recommendations to the project/product team, Center and Agency management.

c. Integrated Independent Review Plan (IIRP) - A document that defines the comprehensive set of reviews for a project/product. An IIRP addresses gateway reviews as described in GPG 1060.2 and defines the project-unique life-cycle series of IIR's as defined in this procedure. It also describes the project approach to engineering peer reviews per GPG 8700.6. The IIRP identifies the co-chairs of the Integrated Independent Review Team. It also addresses reporting and documentation requirements and the process for closeout of Requests for Action. For completeness, the IIRP also lists the pre-launch readiness reviews such as those described in NPD 8610.24.

d. Integrated Independent Review Team (IIRT) - A multi-disciplinary team of experts that is fully independent of the program, project and product teams and largely independent of the performing organizations. The IIRT co-chairs are responsible to the GSFC PMC and the Enterprise Associate Administrator for the conduct and reporting of the Integrated Independent Reviews.

e. Independent Review Team (IRT) – IRT's are associated with the establishment of Enterprise PMC's and the associated effort to streamline the review and reporting process for projects that report to the Agency PMC. IRT reviews combine the objectives of Independent Annual Reviews (chartered by the Agency PMC) and External Independent Readiness Reviews (chartered by the Enterprise Associate Administrator) into a single review process with a single team. The GSFC IIR process takes this concept an additional step and integrates the objectives of these reviews and GSFC reviews into a single process.

f. Gateway Reviews - Reviews conducted by the GSFC PMC, Center Director or the Enterprise Associate Administrator as part of the mission confirmation and mission readiness processes (GPG 1060.2).

g. Request for Action (RFA) - A formal written request from the review team, through the review team chair, that asks for additional information or an action of the project/product team.

h. Engineering Peer Review (EPR) - A focused, in-depth technical review that supports the evolving design and development of a product subsystem or discipline area (GPG 8700.6). The purpose of an EPR is to add value and reduce risk through expert knowledge infusion, confirmation of approach, and specific recommendations. An EPR provides a penetrating examination of design, analysis, manufacturing, integration, test and operational details, drawings, processes and data.

PROCEDURES

The primary responsibility for the full set of reviews for a project/product rests with the manager of the formulation or implementation activities for the system or deliverable product. This individual is hereafter referred to as the Project Manager.

The process defined in the following sections is directly applicable to projects with governance delegated to the GSFC PMC. Process modifications for projects that report to the Agency PMC are described in section 9. Other deviations may be required due to the wide variety of projects and circumstances. The IIRP, as approved by the GSFC PMC Chair, documents and constitutes approval of any deviations from this procedure.

1. Integrated Independent Review Plan (IIRP)

The Project Manager should consult with the Chief, Systems Review Office (SRO) at the outset of project formulation to understand the applicable review processes and begin review planning. The Project Manager, in consultation with the SRO Chief or designee, shall develop and maintain the IIRP for the project. The IIRP shall identify the planned gateway reviews, life-cycle series of Integrated Independent Reviews (IIR's), and pre-launch readiness reviews. The primary objective of each review shall be concisely documented. The IIRP shall also describe the project team's approach to engineering peer reviews.

The Project Manager should provide the proposed IIRP to the Deputy Director for Systems Management of the Office of System Safety and Mission Assurance (OSSMA), also known as the GSFC SMO Director, for approval at least 4 months prior to the desired date for the System Concept Review or equivalent initial system-level review. The co-chairs of the Integrated Independent Review Team (IIRT) are identified per section 4. and documented in the IIRP. The document also addresses the documentation and reporting requirements and the process for closeout of Requests For Action (RFA's). The GSFC PMC Chair and Enterprise Associate Administrator (EAA) shall also approve the IIRP.

Projects that completed a system-level CDR prior to September 28, 2001 may document and implement a transitional approach for the remaining reviews tailored to the unique circumstances of the project.

The IIRP shall be reviewed and updated, as necessary, at each IIR. The IIRP shall be a controlled document maintained by the project in accordance with GPG 1410.2.

2. Scope of Integrated Independent Reviews

The mission elements that will be addressed by the IIRs, and the depth that each element will be addressed, shall be as follows:

- Spacecraft – fully addressed
- Payload – fully addressed
- Launch Vehicle Integration – fully addressed
- Launch Vehicle – mission unique changes and first flight items only
- Ground System – fully addressed
- Mission Operations, Data Capture, Analysis and Distribution – fully addressed
- Institutional Mission Operations Services – mission unique requirements only

IIRs shall be conducted at the system-level at critical milestones in project formulation and implementation. To fully address the spacecraft and payload, the IIRT should also conduct separate focused critical milestone reviews on the spacecraft and each major instrument. The requirements and objectives for these major element reviews shall be documented in the IIRP. Attachment 1 lists a typical set of IIRs for GSFC projects. The SMO web site (http://smo.gsfc.nasa.gov/) provides additional reference materials on the types and objectives of IIRs. The specific set of IIRs for a project may be tailored based on project scope, complexity, and acceptable risk.

Responsibility for launch vehicle flight worthiness certification rests with Kennedy Space Center for expendable launch vehicles and Johnson Space Center for Shuttle. However, IIRs for GSFC projects shall address launch vehicle integration and mission unique changes in sufficient detail to confirm that the overall mission system will function as intended through launch and separation events.

3. Assessment Content of Integrated Independent Reviews

The primary purpose of an IIR is to provide expert technical review of the end-to-end mission system. Through the planned series of IIRs, the IIRT shall evaluate the adequacy of the planning, design, implementation and associated processes to safely and successfully accomplish the mission requirements. The IIRs shall be supported by a comprehensive set of engineering peer reviews conducted in accordance with GPG 8700.6.

The IIRT shall also assess programmatic performance and ability to deliver on commitments as documented in the approved Project Plan, Program Plan or Program Commitment Agreement. The IIRT shall note any observed deficiencies with respect to compliance with NPG 7120.5.

The IIRT shall:

- Confirm the documentation of and assess the compatibility of the success criteria, acceptable risk and allocated resources
- Evaluate the technical content, schedule, staffing and cost of the project over the entire life cycle
- Assess system resource management and margins (e.g. mass, power, propellant)

- Assess technical progress, risks remaining and mitigation plans
- Assess the safety hazards, and hazard mitigation and control strategies
- Assess progress/milestone achievement against approved baselines
- Determine if any deficiencies exist that result in revised projections exceeding predetermined thresholds
- Evaluate the utilization of past lessons learned and the capture of new knowledge

The Project Manager and IIRT shall utilize the GSFC Project Management Checklist as a guide for topics to be addressed during the IIRs. The checklist is maintained on the SMO web site.

Special attention shall be provided to the plans and results for the GSFC Systems Management Process Areas (Attachment 2) during each IIR, as appropriate. These 13 systems management processes provide key metrics to trend over the life cycle of the project and benchmark against other projects.

4. Integrated Independent Review Team (IIRT)

The IIRT shall consist of technical and systems management experts with the composite ability to address the full scope of the project and associated programmatic considerations, with particular emphasis on the areas of highest risk. The projected availability of IIRT members throughout the project life cycle is important to provide continuity. A typical IIRT size should be 5 to 12 members, depending on the scope, complexity and acceptable risk of the project.

All members of the IIRT shall be independent of the program and project team. Accordingly, individuals that supervise those performing work on the project should not serve as members of the IIRT. The IIRT shall be comprised of experts from within and outside of GSFC. This provides for the consideration of best practices and lessons learned from outside of the Center.

Two co-chairs lead the IIRTs for GSFC projects. One co-chair shall be from the GSFC SRO. The other co-chair shall be from outside of GSFC. The SRO Chief appoints the SRO co-chair of the IIRT. The SRO co-chair consults with the Project Manager and Enterprise representatives on the requirements for the other co-chair and remaining members of the IIRT. The SRO Chief appoints all civil servant IIRT members and guides Project Managers in the acquisition of any non-civil servant IIRT members. Co-chair selections are subject to the approval of the SMO Director, GPMC Chair and the EAA. The full IIRT membership shall be documented prior to the first IIR in a memorandum from the SRO Chief to the Project Manager with copies to the IIRT members, SMO Director, and Enterprise representative.

The IIRT co-chairs shall prepare the IIRT, prior to the first IIR, for the efficient and rigorous conduct of IIRs in accordance with this document and the IIRP.

5. Conduct of Integrated Independent Reviews

Prior to each IIR, the Project Manager shall coordinate an agenda with the IIRT co-chairs. The co-chairs preside at the IIR, leading the meeting and keeping the participants (IIRT, customers, project team members, line management, etc.) focused during project presentations and associated discussion. The co-chairs moderate the interaction between the IIRT and the project team, and collect RFA's from IIRT members and other participants.

The Project Manager presents review material and directs the presentations by other members of the project team, providing appropriate guidance to maximize information exchange between the project team and the IIRT. The Project Manager should direct system and subsystem engineers to integrate safety and mission assurance topics with system/subsystem presentations to promote ownership of these overarching values by all members of the project team.

More detailed examination of design and programmatic details may be required and, if necessary, subgroup or "splinter" sessions shall be conducted. Results of subgroup discussions shall be reported to the co-chairs. At the conclusion of each review the co-chairs shall summarize the IIRTs impressions and review the RFAs for clarification of language and for information to the project team.

The IIRT shall prepare a written narrative report to document the IIRT assessment, findings, residual risks and recommendations. The report shall include, but is not limited to, the content shown in Attachment 3. The IIRT co-chairs shall issue the report and RFA's to the Project Manager within 3 weeks of each IIR with copies to the Program Manager, SRO Chief and SMO Director. In cases where another Center is implementing the project, a copy shall also be sent to the SMO Director of that Center.

6. Closed Loop Disposition of Requests for Action

The Project Manager is responsible for addressing the findings and recommendations of the IIRT. The Project Manager shall submit RFA responses in writing to the IIRT co-chairs for formal, closed-loop closure of the RFAs. The Project Manager should address the findings and respond to the recommendations as soon as possible to maximize the value of the review to the project.

The IIRT co-chairs and the RFA originator**s** shall review RFA responses jointly for acceptability. The co-chairs shall approve or reject the responses and notify the Project Manager in writing of their decisions. In the case of incomplete or unacceptable responses, the IIRT shall provide additional information to clarify the issue and guide the project.

The Project Manager may challenge a finding or recommendation of the IIRT. The Project Manager and IIRT shall attempt to resolve any differences of opinion between them. Either party may elevate the issue to the SMO Director for resolution. If the Project Manager is dissatisfied with the resolution from the SMO Director, the Project Manager may appeal to the GSFC PMC.

7. Reporting the Results of Integrated Independent Reviews

The Project Manager shall report the summary result of each IIR to the GSFC PMC during the Monthly Status Review following each IIR. The SMO Director shall report any major issues from an IIR to the GSFC PMC.

The IIRT co-chairs shall formally present the IIRT assessment, evaluation of residual risks and recommendations to the GPMC and EAA as part of the Mission Confirmation Review and Mission Readiness Review processes. The IIRT co-chairs shall provide additional briefings as requested by the EAA, Center Director or GPMC.

Prior to launch, the IIRT co-chairs shall prepare a Flight Readiness Report (known as a "Redbook") that includes a summary of the project IIR process and assessment of the residual risks. The Director of OSSMA shall submit the Flight Readiness Report to the GSFC PMC Chair and Center Director.

8. Documentation and Lessons Learned

The IIRP, review presentation materials, and review supporting materials (drawings, analyses, technical reports, etc.) are controlled documents and shall be maintained by the Project Manager throughout the project life cycle. The recommended tool for tracking RFA status is the centralized action item tracking system for the project.

IIR process lessons learned and best practices may be submitted by any IIR participant to SMO Director at any time.

The IIRT shall confirm that project teams have queried the NASA Lessons Learned Information System (LLIS, http://llis.nasa.gov) and other knowledge resources, as appropriate, to access relevant past experiences and knowledge that can be leveraged to reduce risk, improve quality and efficiency. Queries should be conducted at the beginning of and then periodically throughout the project lifecycle.

The IIRT shall assist the project team in recognizing lessons learned and encourage project team members to submit their own significant lessons learned to the web-based LLIS in order to make critical knowledge available to other NASA teams as quickly as possible.

9. Projects that Report to the Agency PMC

In the case of projects that report to the Agency PMC, mission level IIRs will be conducted by two clearly identifiable review teams that function as a single team (i.e., IIRT). Agency level Independent Review Team (IRT) processes will be used to select a review chair and review team members from outside of GSFC. The chair should be external to NASA. This review team will be designated as the IRT. The SRO Chief will appoint the chair and members of the independent GSFC review team as described herein. This review team will be known as the Center SMO review team.

The overall size and composition of the two teams should be comparable to an IIRT. The IRT should be limited to 6 to 8 members with individual expertise in project management, system engineering and the 2 or 3 engineering disciplines with the greatest risk. The SMO review team will provide more comprehensive discipline coverage.

The two teams will collaborate on a common agenda and jointly conduct the mission level IIRs. The SMO review team will conduct any spacecraft and instrument level reviews on their own with augmentation as appropriate. The SRO review chair shall ensure that the requirements of this GPG are satisfied for mission and lower level reviews. Additional requirements may be imposed by the IRT process and are the responsibility of the IRT chair. The two review teams will issue a common set of RFA's to the project team.

The IRT and SMO review team chairs will brief the GSFC PMC as part of the mission confirmation and mission readiness review processes and upon request of the GSFC PMC. The IRT chair will report to the Enterprise PMC for these gateway reviews and upon request.

Attachment 1
Typical Integrated Independent Reviews for GSFC Projects*

- System Requirements Review (SRR)
- System Concept Review (SCR)
- System Preliminary Design Review (PDR)
- Instrument X PDR
- Instrument Y PDR
- Spacecraft PDR
- Instrument X CDR
- Instrument Y CDR
- Spacecraft CDR
- System Critical Design Review (CDR)
- Spacecraft Pre-Environmental Review (PER)
- Instrument X PER
- Instrument Y PER
- Spacecraft Pre-Shipment Review (PSR)
- Instrument X PSR
- Instrument Y PSR
- Mission Operations Review (MOR)
- System Pre-Environmental Review (PER)
- Operations Readiness Review (ORR)
- System Pre-Shipment Review (PSR)

* May be tailored based on the scope, complexity and acceptable risk of the project. Additional information on the reviews may be found at http://smo.gsfc.nasa.gov/

Attachment 2
GSFC Systems Management Process Areas

These following 13 systems management process areas provide key metrics to assess the project, trend over the life cycle of the project and measure overall GSFC performance:

1. The level, competence and independence of technical peer reviews that were performed on each of the elements and components - hardware and software.

2. The performance, level and independence of system level reviews that were conducted- hardware and software.

3. The level and thoroughness of the analysis, test and verification program. The test and verification program at all levels from black box to spacecraft and integrated mission shall be detailed. This shall also include the validation and verification (V&V) and independent validation and verification (IV&V) processes used on software. The IIRT shall assess the project's Software Risk Assessment relative to the IV&V criteria (http://ivvcriteria.ivv.nasa.gov/) and report the result at the MCRR. The IIRT shall confirm accurate representation of the scope, heritage and complexity of all mission software and the subsequent decision on the level of IV&V to be employed.

4. The level of mission assurance that was imposed on the implementation of the mission (hardware and software). This shall include parts and material usage as well as workmanship standards imposed. It shall also address the software assurance processes implemented.

5. The systems management imposed and implemented for the mission. This shall include the performance and thoroughness of analyses, requirements management, systems engineering, risk management, software assurance, configuration management, documentation and technical record keeping and workmanship and test process management.

6. Factors such as staffing and the experience of the implementing organizations.

7. Physical and analytical integration processes, plans and results for all of the hardware and software elements of the mission. This shall include information on the review and assessment of all failures and anomalies and their resolution.

8. Information on the failure-free as well as the total operating time on all mission critical hardware and software.

9. The results of the IIR process shall be detailed. It shall include an assessment of all RFAs and the Project responses to those RFAs.

10. The amount, level and fidelity of mission simulations and launch/operations training to prepare the mission for launch, on-orbit and end of mission disposal operations including identification of all planned contingency operations and operations rehearsed by the operations team. Identify any green

card exercises (postulated mission contingencies which require action by the operations team). Provide a spacecraft mission timeline from liftoff to commencement of normal science operations and identify for each step the corrective action to be taken if the mission event does not occur as planned.

11. Provide the Failure Mode and Effects Analyses (FMEA) and the Fault Tree Analyses (FTA) that were performed for the program with appropriate annotations and tutorials. Provide the results of the Probabilistic Risk Assessments (PRA) that were performed. Delineate design changes that were driven by FMEA, FTA, and PRA results.

12. Requirements derivation, functional allocation, verification and validation. Provide a Verification Matrix for mission requirements that shows the pre-launch verification of the mission level requirements. This matrix shall address both the fidelity and type of verification.

13. Identify all single point failures and provide a subjective assessment of the probability of each such failure mode causing a mission failure. Also provide adequate rationale to substantiate the subjective assessment.

Attachment 3
IIRT Report Content Guidelines

IIRT reports following each system-level IIR shall include the following content. IIRT reports following instrument, spacecraft or subsystem-level IIRs and operations-oriented reviews (e.g., MOR, ORR) are permitted to indicate that certain aspects of these report guidelines or 13 process areas are not relevant for the subject review and are evaluated at the system-level.

1. Document the IIRTs assessment of project performance in each of the 13 systems management process areas. Each of the areas shall be rated on a scale of 1 to 10. A score of 10 is associated with a very superior implementation. A score of 7 is associated with the nominal process implementation expected to result in the residual risk at the time of launch to be categorized as low. Each area judged less than nominal (a score less than 7) shall be identified and documented under Item #2 below. Early in the project life cycle, it may not be possible or appropriate to score all 13 areas. A notation of "TBD" is appropriate in these instances. Scoring of an individual process area should commence once the project is able to address the intended implementation for that process area. Scoring should reflect the anticipated result if the project implements the plan as described. This early feedback to the project is essential since these 13 systems management processes provide key metrics to trend over the life cycle of the project and benchmark against other projects.

2. Document all residual risks (technical and programmatic), judged to be any level higher than low, relative to the success criteria and programmatic commitments. Provide recommendations on methods and implementations to mitigate these identified higher-than-low risks. The NASA standard 5X5 matrix shall be used to categorize (low, medium, high) and report the risks.

3. Provide an assessment of single point failure (SPF) mechanisms and a recommendation on the acceptability or non-acceptability, with appropriate rationale, for the collected set of SPFs and/or specific SPFs. Early in the project life cycle, when detailed design information is not yet available, this SPF assessment should reflect the adequacy of the intended project approach to SPFs.

4. Specifically address risk analysis activities and results (e.g. FMEA, FTA and PRA) from a system engineering perspective. Where these analyses have not been performed or are not complete, the IIRT shall assess the plans and work that has been done relative to what the IIRT determines is appropriate for the elements of the project.

5. Include overall statements of project status relative to the review objectives and overall residual risk, along with justification for these statements.

CHANGE HISTORY LOG

Revision	Effective Date	Description of Changes
Baseline	08/12/98	
A	10/06/98	• Header and footer format changes. New title for GPG 1310.1 reference. • Deleted Center Director approval of SRP's. • Identified responsibilities for maintenance of quality records.
A	03/31/99	• Footer format changes. • Moved paragraph 3. Records to P6 in order to comply with GPG 1410.1.
A	04/02/99	• Deleted Product Verification/Audit Records, Peer Review Plan, and System Review and Peer Packages from Records table • Added System Review Summary and System Review Program Summary to Records Table
B	08/17/99	• Substituted GPG 7120.2 for GPG 8730.4 as a reference. • Re-defined P2 Applicability of this GPG to GSFC product to eliminate Systems Reviews for certain classes of products • Clarified responsibility of Product Manager to initiate Systems Review Plan.
C	11/02/99	• Added requirement for SRP control by Product Manager. • Added requirement for PRP control by PDL. • Added requirement for Peer Review chairperson to submit a summary within 30 calendar days. • Added clarification that the System Review Summary is submitted to Code 100 for information. • Revised flowcharts to reflect changed processes.
D	09/28/01	• Title and terminology changed to reflect new review process that consolidates the objectives of several Center and HQ reviews. • Updated wording for applicability, retained original scope. • Changed record custodian for all quality records to Project Manager. Quality records updated to reflect new process. • Deleted specific requirements for peer reviews and added references to new GPG 8700.6, Engineering Peer Reviews.

CHANGE HISTORY LOG (cont.)

Revision	Effective Date	Description of Changes
D (cont.)	09/28/01	• Incorporated the scope and requirements of Red Team Reviews and HQ independent assessments, as appropriate, to enable the consolidation of the review process to reduce the burden on projects and improve the value to the Agency. • Reflected the newly established role of the Systems Management Office in the independent assessment process. • Incorporated lessons learned requirements. • Deleted requirement for the System Review Program • Summary to be submitted to Code 100 for information • Revised flowcharts to reflect changed processes.
E	04/11/03	• Clarified applicability to exclude products not intended for space flight. • Added metrics to measure value to projects and trend performance against the 13 system management processes. • Corrected title, custodian and references to records and controlled documents. • Provided for approved deviations from this procedure. • Provided for a transitional review process for projects that completed CDR prior to September 28, 2001. • Deleted process flow figures. • Added guidance for integrating safety and mission assurance topics in reviews. • Clarified expectations for IIRT assessment of compliance with NPG 7120.5, Program and Project Plans. • Added requirement for IIRT to confirm proper level of software IV&V per GSFC PMC action item closure. • Clarified IIRT report content and requirements for assessing the 13 systems management process areas and residual risk.